

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method for estimating a head-related transfer function (HRTF) for an individual, comprising the steps of:
training an estimation model, using (1) information associated with head-related transfer functions for each of a plurality of individuals and (2) information associated with physical characteristics for each of said plurality of individuals obtained using at least one image of each of said plurality of individuals, wherein said estimation model ~~which~~ maps ~~observable~~ physical characteristics of [[a]] said plurality of individuals to audio-related HRTF data for the individuals, respectively;
obtaining ~~observable~~ physical characteristics for a subject whose HRTF is unknown using at least one image of said subject whose HRTF is unknown; and
processing said obtained characteristics in accordance with said model to produce an estimate of an HRTF for said subject whose HRTF is unknown.
2. (Currently amended) The method of claim 1 wherein said ~~observable~~ physical characteristics are derived from an image of an individual's ear.
3. (Currently amended) The method of claim 2 wherein said image includes the individual's head, and said ~~observable~~ physical characteristics include the location of an ear on the head.
4. (Currently amended) The method of claim 3 wherein said ~~observable~~ physical characteristics include the relative orientation of the ear on the head.
5. (Currently amended) The method of claim 2 wherein said ~~observable~~ physical characteristics include the shape of the individual's ear.
6. (Original) The method of claim 5 wherein said shape is determined relative to a canonical ear template.

7. (Currently amended) The method of claim 5 wherein said ~~observable~~ physical characteristics include the three-dimensional shape of the ear.
8. (Original) The method of claim 2 wherein said image is a grayscale image in which color direction for the color gray is customized to the subject's skin color.
9. (Currently amended) The method of claim 1 wherein said ~~observable~~ physical characteristics include physical dimensions of an individual.
10. (Original) The method of claim 9 wherein said physical dimensions include the spacing between an individual's ears.
11. (Original) The method of claim 9 wherein said physical dimensions include the spacing between the individual's ears and shoulders.
12. (Original) The method of claim 9 wherein said physical dimensions are derived from an image of the individual.
13. (Original) The method of claim 1 wherein said audio-related HRTF data includes an interaural time delay.
14. (Original) The method of claim 1 wherein said audio-related HRTF data includes frequency warping relating to a canonical HRTF.
15. (Original) The method of claim 1 wherein said audio-related HRTF data includes a warped Fourier-transform magnitude for an HRTF.
16. (Original) The method of claim 1 wherein said estimation model comprises a coupled eigen-space model.
17. (Original) The method of claim 1 wherein said estimation model is based upon a support vector network.
18. (Original) The method of claim 1 wherein said training and processing steps are implemented with neural network processing.

19. (Currently amended) A method for estimating a head-related transfer function for a given person, comprising the steps of:
- obtaining a head-related transfer function for each of a plurality of individuals;
 - providing at least one image of each of said individuals which depict physical characteristics of each individual;
 - computing a model, using (1) information associated with said obtained head-related transfer functions for each of said plurality of individuals and (2) information associated with said depicted physical characteristics of each individual, wherein said model which defines a coupling between the physical characteristics of a person subject and that person's said subject's head-related transfer function;
 - providing an image of a person whose head-related transfer function is unknown to obtain data about physical characteristics of [[that]] said person whose head-related transfer function is unknown; and
 - applying said data to said coupling model to estimate a head-related transfer function for [[that]] said person whose head-related transfer function is unknown.
20. (Original) The method of claim 19 wherein said image includes the person's outer ear.
21. (Original) The method of claim 20 wherein said image includes the person's head.
22. (Original) The method of claim 19 wherein said head-related transfer functions are obtained by measuring each individual's response to a plurality of sounds which propagate from sources that are located at different respective positions relative to the individual.
23. (Cancelled)
24. (Cancelled)
25. (Cancelled)
26. (Cancelled)
27. (Cancelled)
28. (Cancelled)

29. (Cancelled)
30. (Cancelled)
31. (Cancelled)
32. (Currently amended) A system for generating spatial sound, comprising:
a sound source which produces plural sound signals that are respectively associated with different locations relative to a listener;
a head-related transfer function (HRTF) estimator which processes at least one image of the listener, obtaining information associated with physical characteristics for said listener using said at least one image of the listener, in accordance with a model that maps ~~observable~~ physical characteristics of a plurality of individuals to audio-related HRTF data for the individuals, to produce an estimate of an HRTF for the listener, wherein said estimator is obtained using (1) information associated with head-related transfer functions for each of said plurality of individuals and (2) information associated with physical characteristics for each of said plurality of individuals obtained using at least one image of each of said plurality of individuals;
an HRTF filter which modifies said sound signals in accordance with the estimated HRTF for the listener; and
an audio output device for generating sounds represented by the modified sound signals.
33. (Original) The system of claim 32 wherein said image depicts at least one of the listener's ears.
34. (Original) The system of claim 33 wherein said image includes the listener's head.
35. (Original) The system of claim 32 wherein said model comprises a coupled eigen-space model.
36. (Original) The system of claim 32 wherein said model is based upon a support vector network.

INTERVIEW SUMMARY UNDER 37 CFR §1.133 AND MPEP §713.04

A telephonic interview in the above-referenced case was conducted on August 10, 2005 between the Examiner and the Applicants' undersigned representative. The mailing date of the Final Office Action was discussed. The Examiner has indicated in the Interview Summary mailed August 24, 2005 that the correct mailing date of the Final Office Action should read June 13, 2005.

A telephonic interview in the above-referenced case was conducted on September 7, 2005 between the Examiner and the Applicants' undersigned representative. The Final Office Action mailed on June 13, 2005 was discussed. Specifically, the rejections of claims 1, 19, and 32 in light of Lambrecht (U.S. Patent No. 6,181,800) and Gardner (U.S. Patent No. 6,243,476) and the proposed amendments set forth herein were discussed with the intent to place the claims in better condition for allowance or appeal.

The Applicants wish to thank the Examiner for his time and attention in this case.